FIG.1

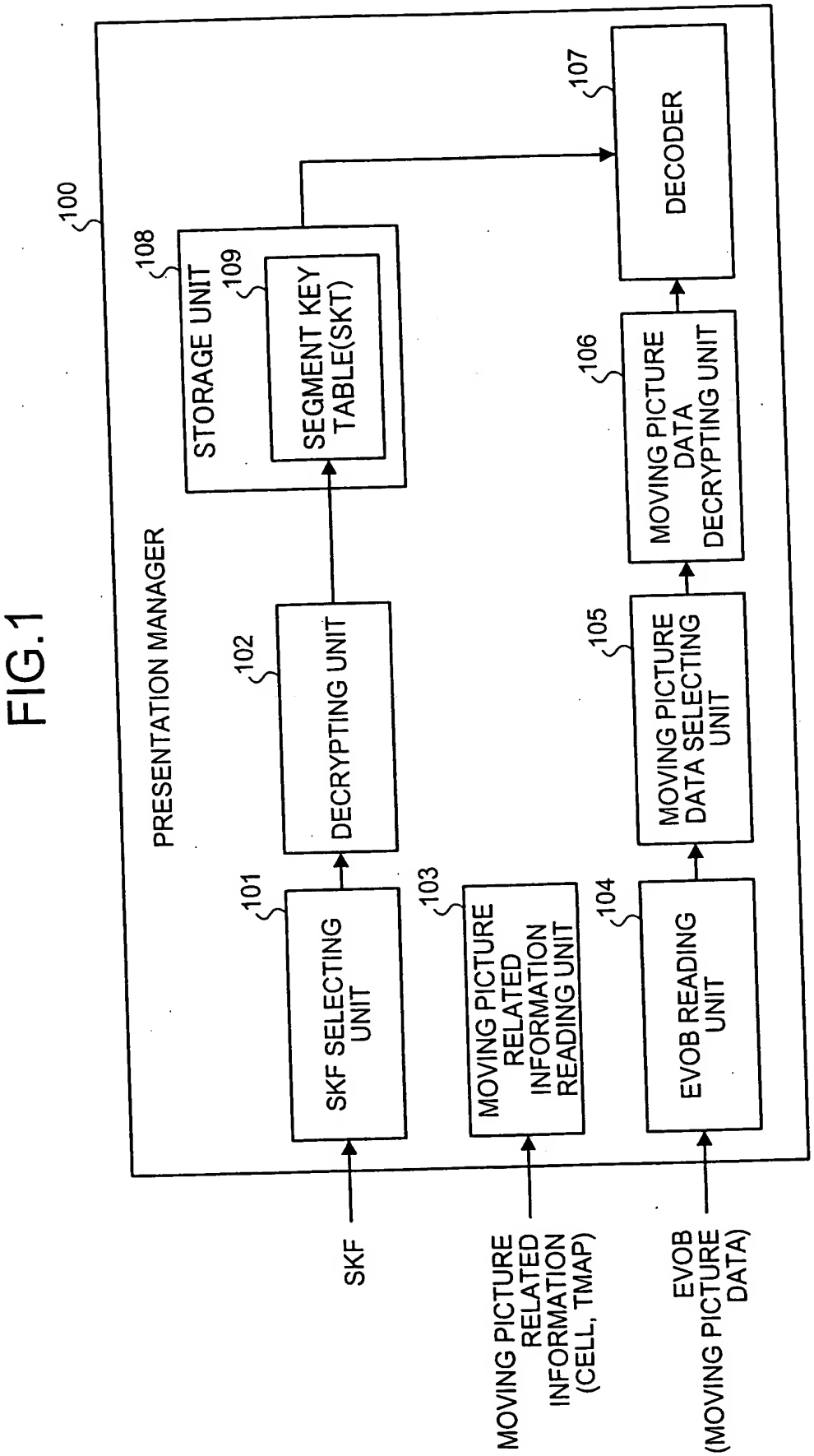

100
PRESENTATION MANAGER
101
SKF SELECTING UNIT
102
DECRYPTING UNIT
103
MOVING PICTURE RELATED INFORMATION READING UNIT
104
EVOB READING UNIT
105
MOVING PICTURE DATA SELECTING UNIT
106
MOVING PICTURE DATA DECRYPTING UNIT
107
DECODER
108
STORAGE UNIT
109
SEGMENT KEY TABLE(SKT)
SKF
MOVING PICTURE RELATED INFORMATION (CELL, TMAP)
EVOB (MOVING PICTURE DATA)

FIG.2

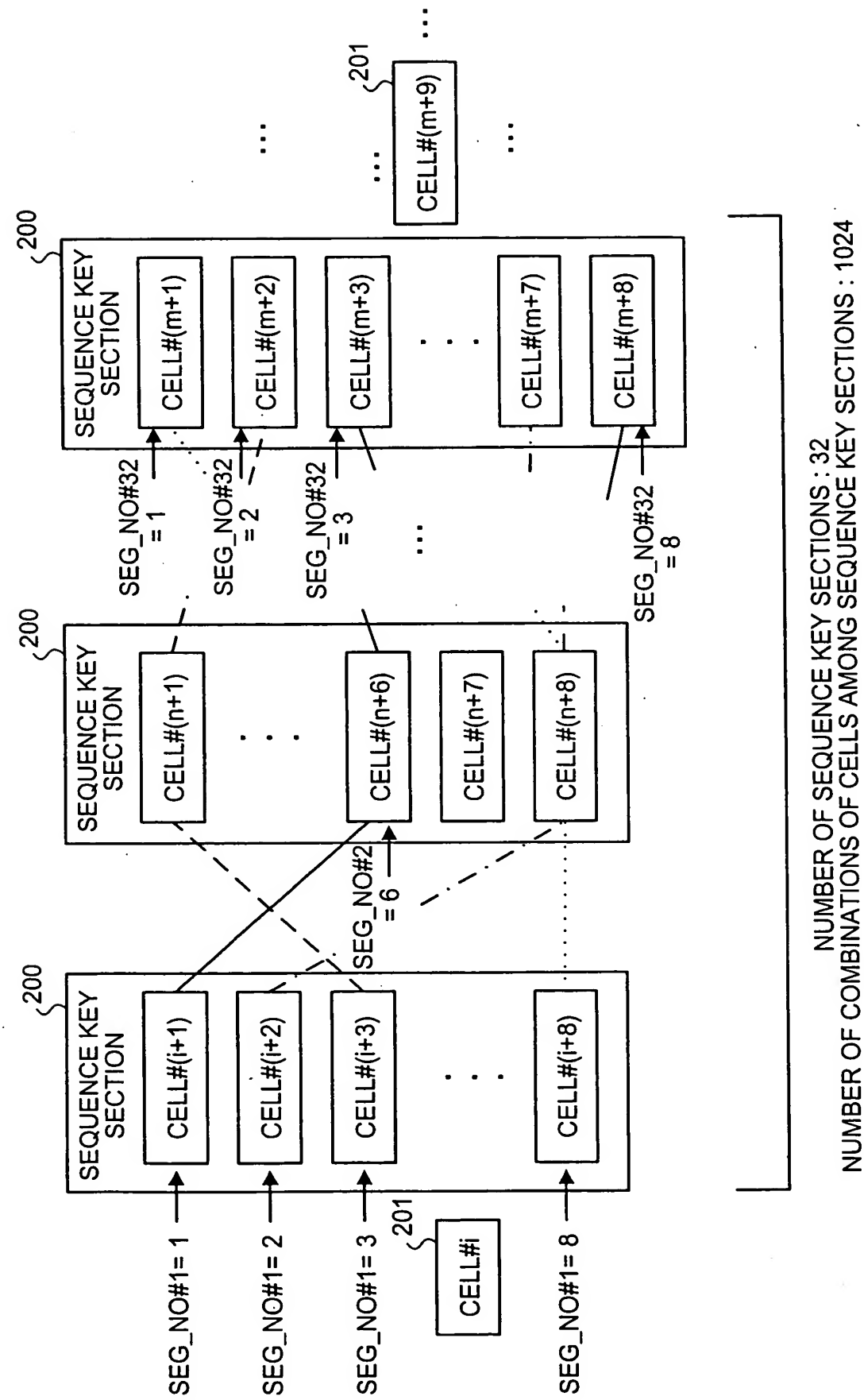

SEQUENCE KEY SECTION
200
CELL#i
201
CELL#(i+1)
CELL#(i+2)
CELL#(i+3)
CELL#(i+8)
CELL#(n+1)
CELL#(n+6)
CELL#(n+7)
CELL#(n+8)
CELL#(m+1)
CELL#(m+2)
CELL#(m+3)
CELL#(m+7)
CELL#(m+8)
CELL#(m+9)
SEG_NO#1= 1
SEG_NO#1= 2
SEG_NO#1= 3
SEG_NO#1= 8
SEG_NO#2 = 6
SEG_NO#32 = 1
SEG_NO#32 = 2
SEG_NO#32 = 3
SEG_NO#32 = 8
NUMBER OF SEQUENCE KEY SECTIONS : 32
NUMBER OF COMBINATIONS OF CELLS AMONG SEQUENCE KEY SECTIONS : 1024

FIG.3

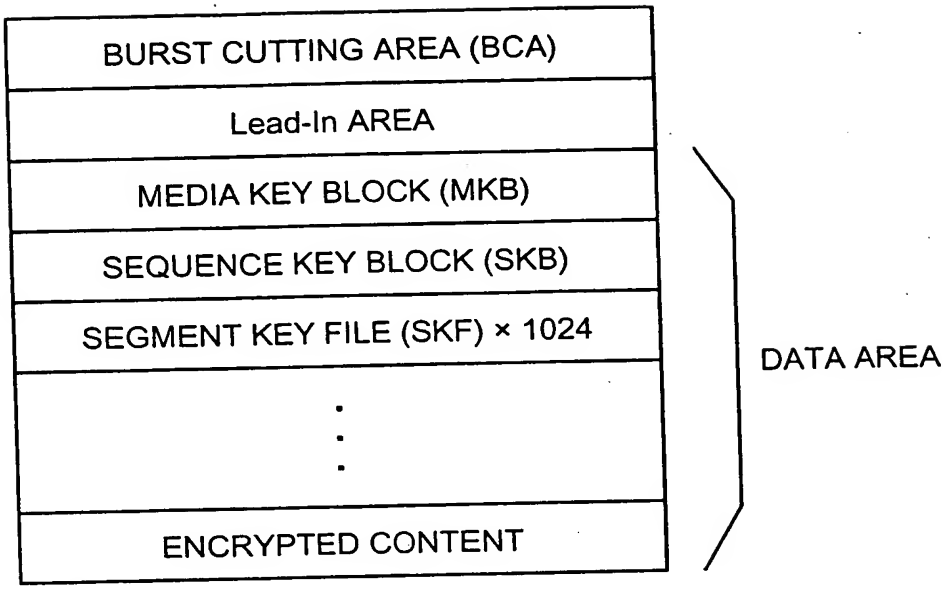

BURST CUTTING AREA (BCA)
Lead-In AREA
MEDIA KEY BLOCK (MKB)
SEQUENCE KEY BLOCK (SKB)
SEGMENT KEY FILE (SKF) × 1024
ENCRYPTED CONTENT
DATA AREA

FIG.4

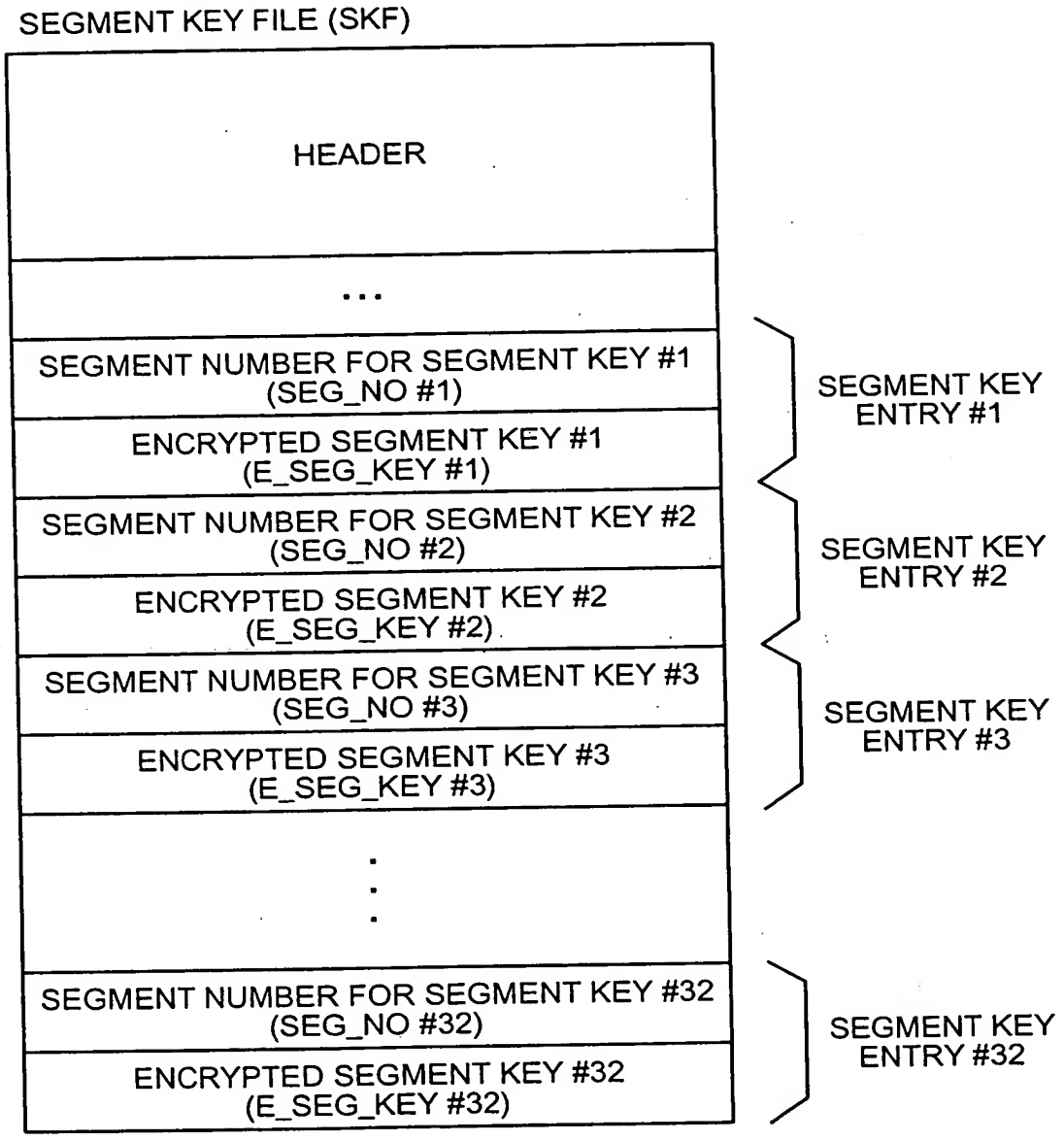

SEGMENT KEY FILE (SKF)
HEADER
...
SEGMENT NUMBER FOR SEGMENT KEY #1 (SEG_NO #1)
ENCRYPTED SEGMENT KEY #1 (E_SEG_KEY #1)
SEGMENT NUMBER FOR SEGMENT KEY #2 (SEG_NO #2)
ENCRYPTED SEGMENT KEY #2 (E_SEG_KEY #2)
SEGMENT NUMBER FOR SEGMENT KEY #3 (SEG_NO #3)
ENCRYPTED SEGMENT KEY #3 (E_SEG_KEY #3)
SEGMENT NUMBER FOR SEGMENT KEY #32 (SEG_NO #32)
ENCRYPTED SEGMENT KEY #32 (E_SEG_KEY #32)
SEGMENT KEY ENTRY #1
SEGMENT KEY ENTRY #2
SEGMENT KEY ENTRY #3
SEGMENT KEY ENTRY #32

FIG.5A

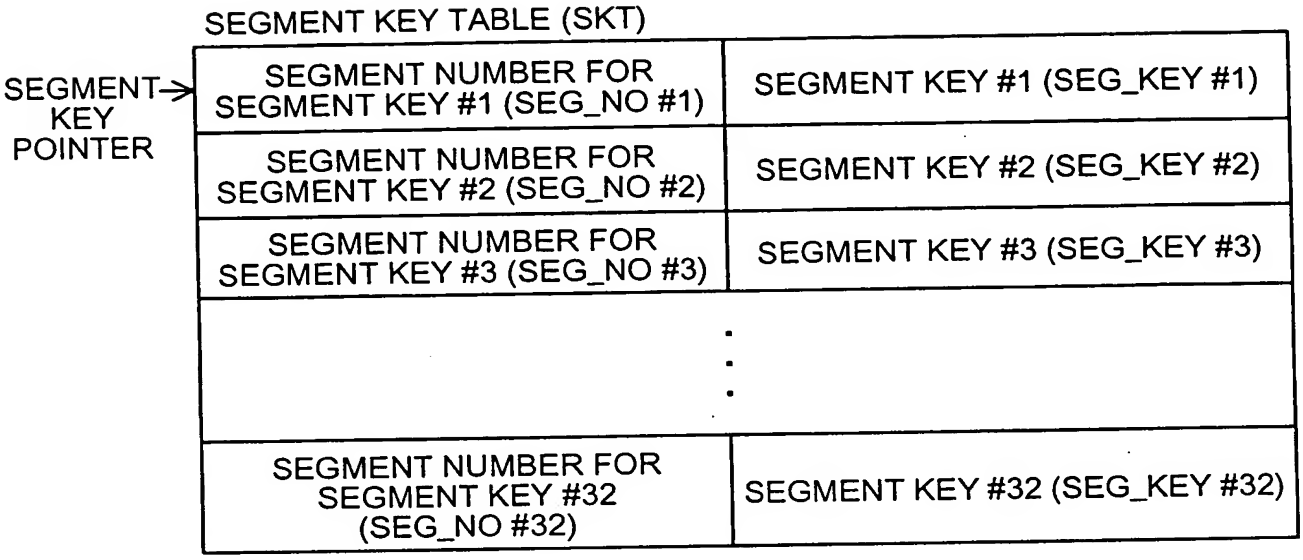


FIG.5B

EXAMPLE OF SKT

SEG_NO #1 = 1	SEGMENT KEY #1 (SEG_KEY #1)
SEG_NO #2 = 6	SEGMENT KEY #2 (SEG_KEY #2)
SEG_NO #32 = 8	SEGMENT KEY #32 (SEG_KEY #32)

FIG.6

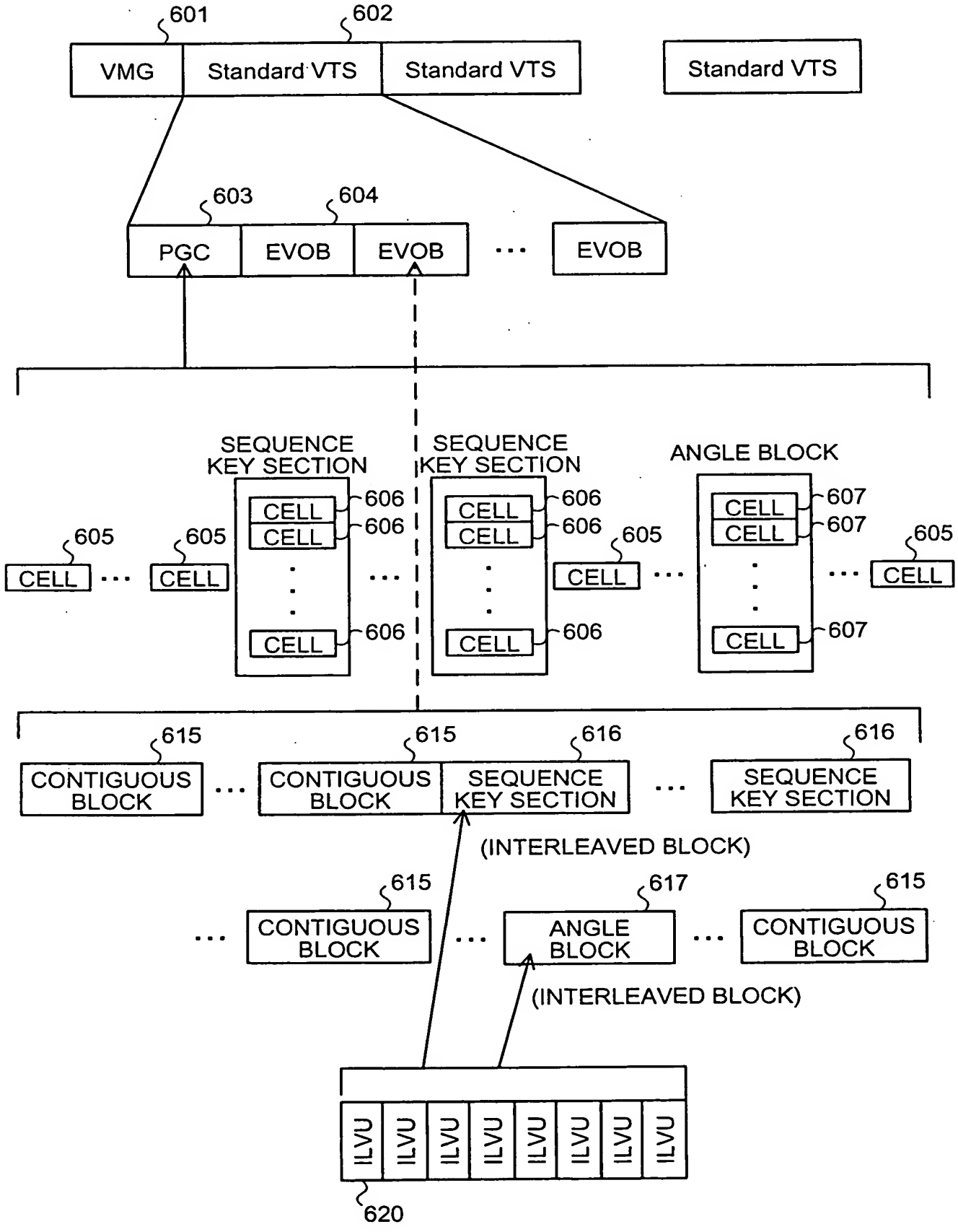

601
602
VMG
Standard VTS
Standard VTS
Standard VTS
603
604
PGC
EVOB
EVOB
EVOB
SEQUENCE KEY SECTION
SEQUENCE KEY SECTION
ANGLE BLOCK
CELL
606
607
605
615
616
617
CONTIGUOUS BLOCK
SEQUENCE KEY SECTION
(INTERLEAVED BLOCK)
ANGLE BLOCK
ILVU
620

FIG.7

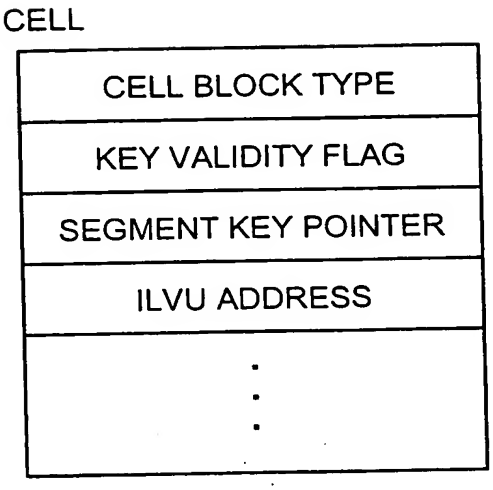

CELL
CELL BLOCK TYPE
KEY VALIDITY FLAG
SEGMENT KEY POINTER
ILVU ADDRESS

FIG. 8

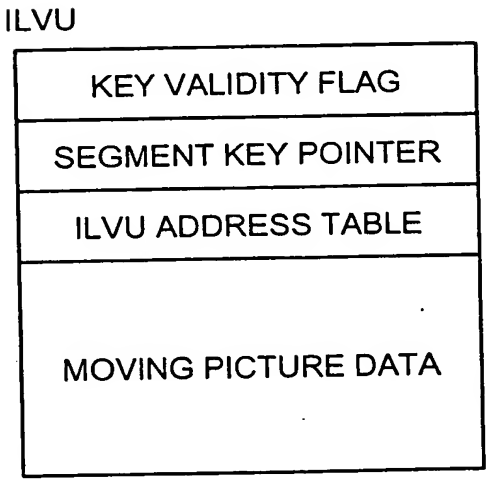

ILVU
KEY VALIDITY FLAG
SEGMENT KEY POINTER
ILVU ADDRESS TABLE
MOVING PICTURE DATA

FIG.9A

ILVU ADDRESS TABLE

SEQ_C1_DSTA
SEQ_C2_DSTA
SEQ_C3_DSTA
SEQ_C4_DSTA
SEQ_C5_DSTA
SEQ_C6_DSTA
SEQ_C7_DSTA
SEQ_C8_DSTA
SEQ_C9_DSTA

FIG.9B

EXAMPLE (SEGMENT NUMBER =2)

0x7FFFFFFFFFFF(INVALID)
ADDRESS & SIZE OF NEXT ILVU
0x7FFFFFFFFFFF(INVALID)
0x7FFFFFFFFFFF(INVALID)
0x7FFFFFFFFFFF(INVALID)
0x7FFFFFFFFFFF(INVALID)
0x7FFFFFFFFFFF(INVALID)
0x7FFFFFFFFFFF(INVALID)
0x7FFFFFFFFFFF(INVALID)

FIG.10

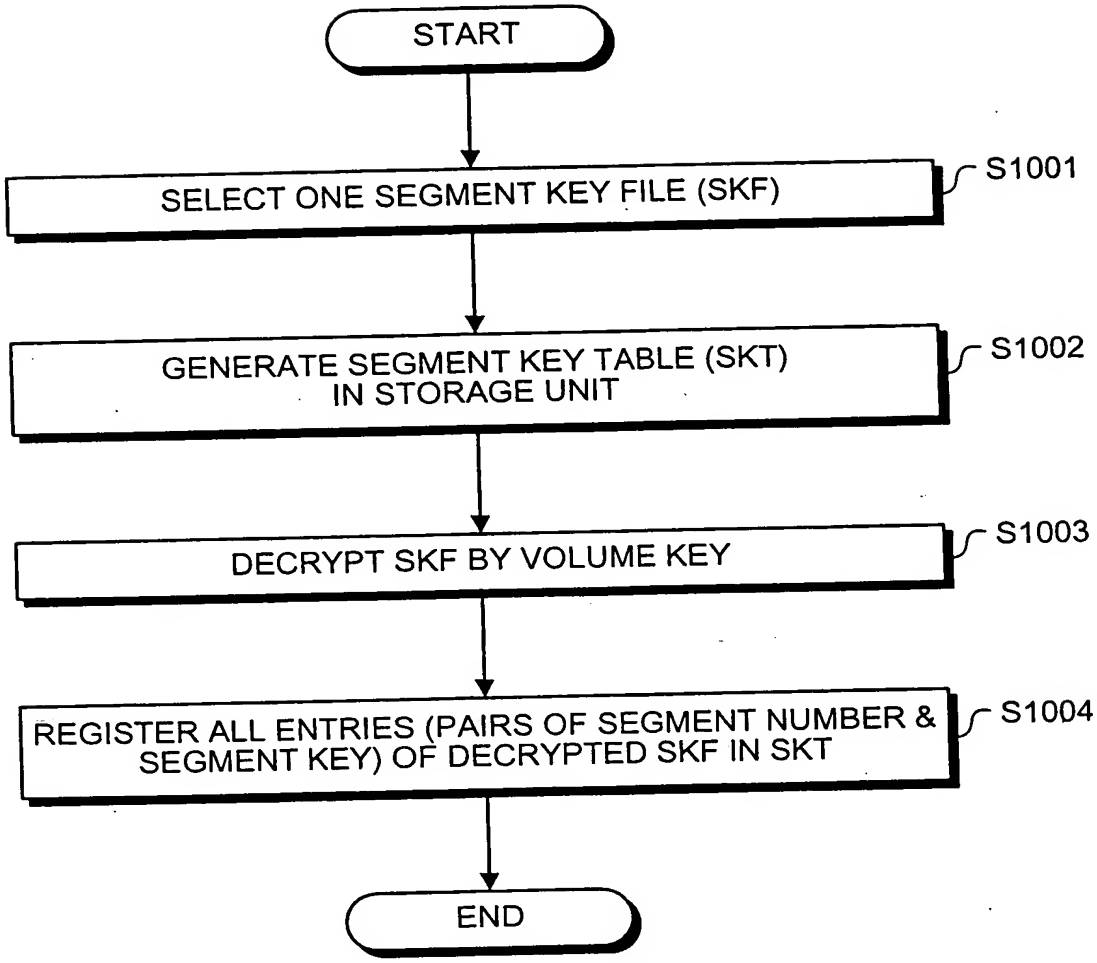

START
SELECT ONE SEGMENT KEY FILE (SKF)
S1001
GENERATE SEGMENT KEY TABLE (SKT) IN STORAGE UNIT
S1002
DECRYPT SKF BY VOLUME KEY
S1003
REGISTER ALL ENTRIES (PAIRS OF SEGMENT NUMBER & SEGMENT KEY) OF DECRYPTED SKF IN SKT
S1004
END

FIG.11

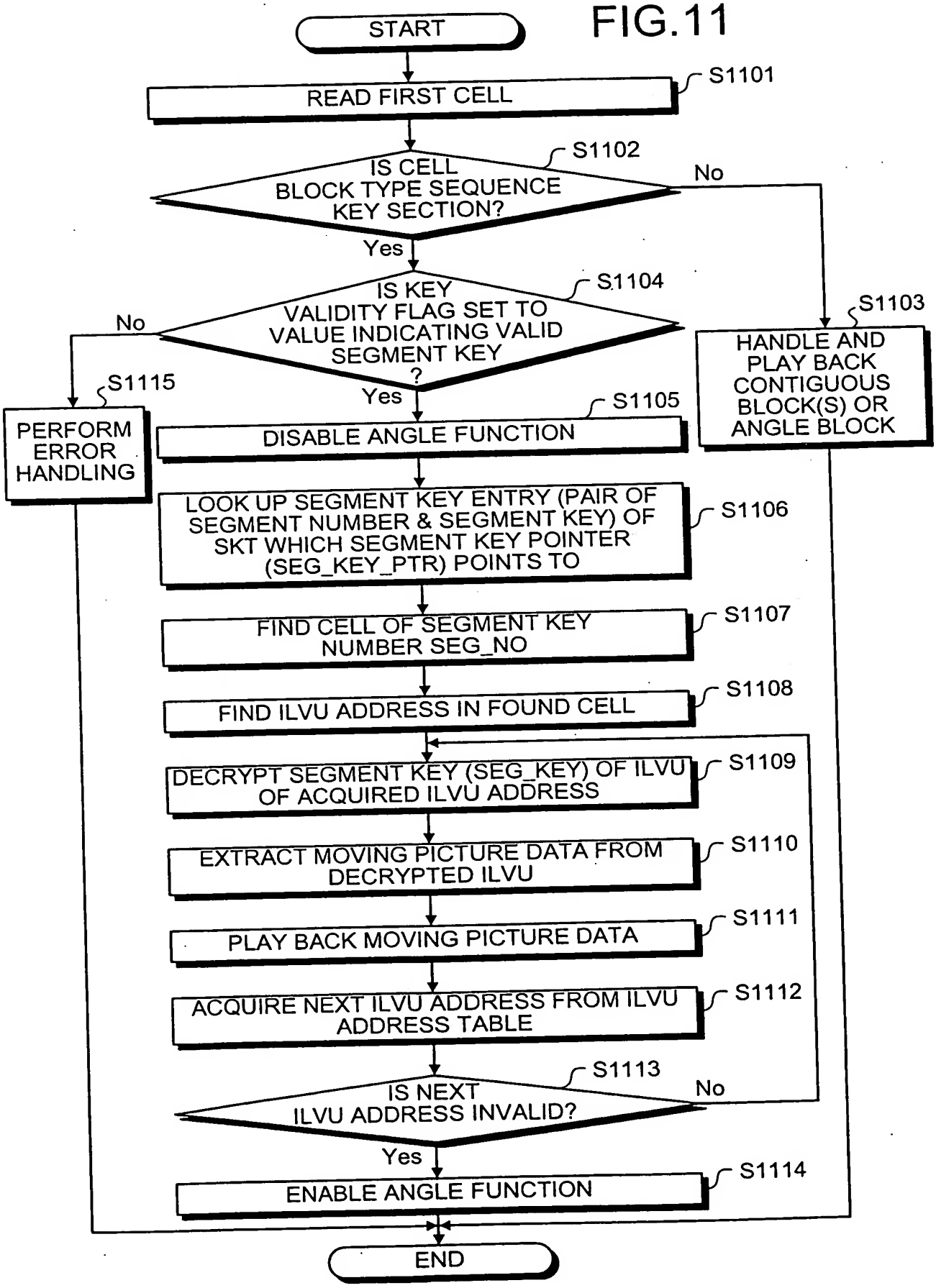

START
READ FIRST CELL
S1101
IS CELL BLOCK TYPE SEQUENCE KEY SECTION?
S1102
No
Yes
IS KEY VALIDITY FLAG SET TO VALUE INDICATING VALID SEGMENT KEY ?
S1104
No
Yes
S1103
HANDLE AND PLAY BACK CONTIGUOUS BLOCK(S) OR ANGLE BLOCK
S1115
PERFORM ERROR HANDLING
S1105
DISABLE ANGLE FUNCTION
LOOK UP SEGMENT KEY ENTRY (PAIR OF SEGMENT NUMBER & SEGMENT KEY) OF SKT WHICH SEGMENT KEY POINTER (SEG_KEY_PTR) POINTS TO
S1106
FIND CELL OF SEGMENT KEY NUMBER SEG_NO
S1107
FIND ILVU ADDRESS IN FOUND CELL
S1108
DECRYPT SEGMENT KEY (SEG_KEY) OF ILVU OF ACQUIRED ILVU ADDRESS
S1109
EXTRACT MOVING PICTURE DATA FROM DECRYPTED ILVU
S1110
PLAY BACK MOVING PICTURE DATA
S1111
ACQUIRE NEXT ILVU ADDRESS FROM ILVU ADDRESS TABLE
S1112
IS NEXT ILVU ADDRESS INVALID?
S1113
No
Yes
ENABLE ANGLE FUNCTION
S1114
END

FIG.12

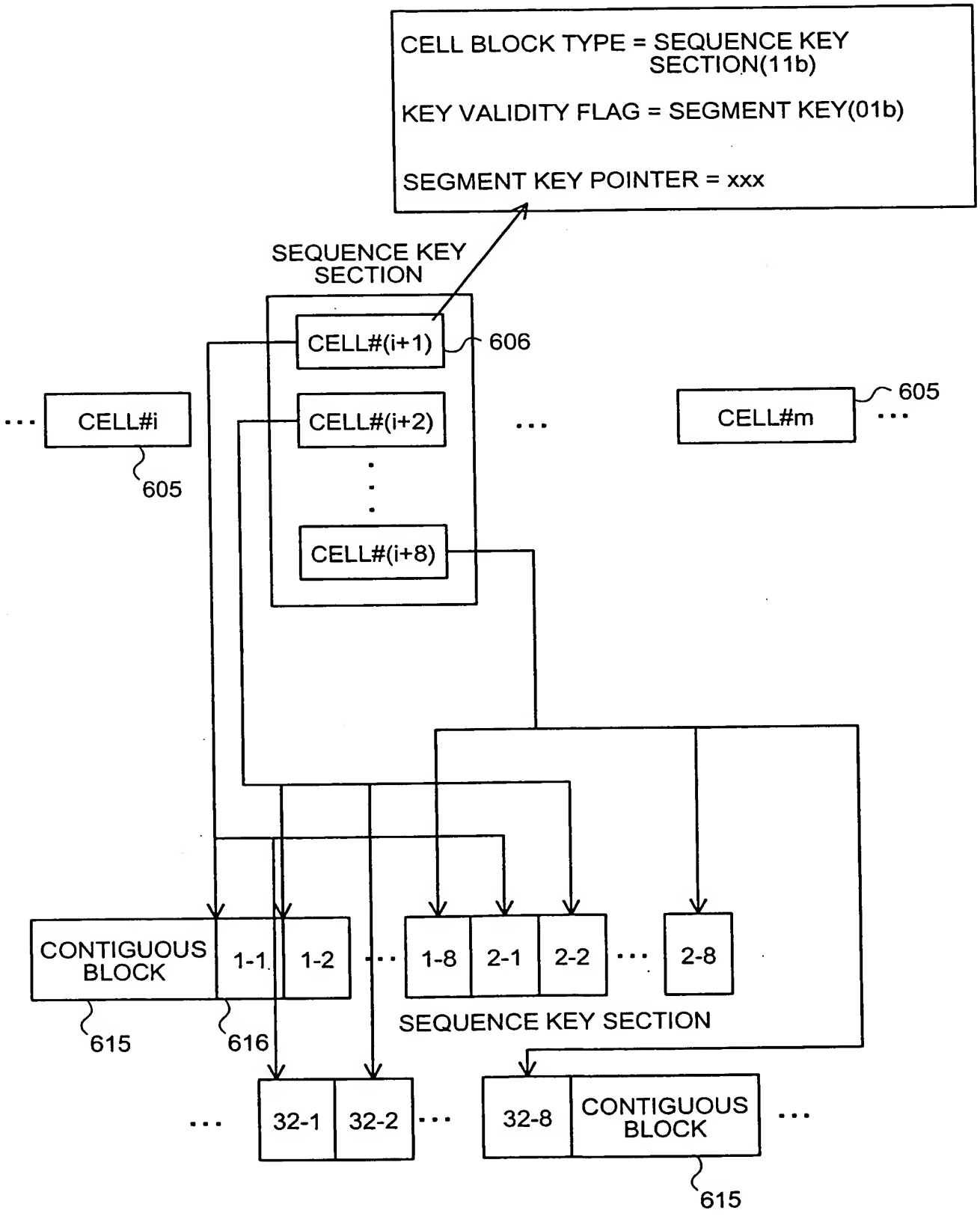

CELL BLOCK TYPE = SEQUENCE KEY SECTION(11b)
KEY VALIDITY FLAG = SEGMENT KEY(01b)
SEGMENT KEY POINTER = xxx
SEQUENCE KEY SECTION
CELL#(i+1)
606
CELL#(i+2)
CELL#(i+8)
CELL#i
605
CELL#m
605
CONTIGUOUS BLOCK
1-1
1-2
1-8
2-1
2-2
2-8
SEQUENCE KEY SECTION
615
616
32-1
32-2
32-8
CONTIGUOUS BLOCK
615

FIG.13

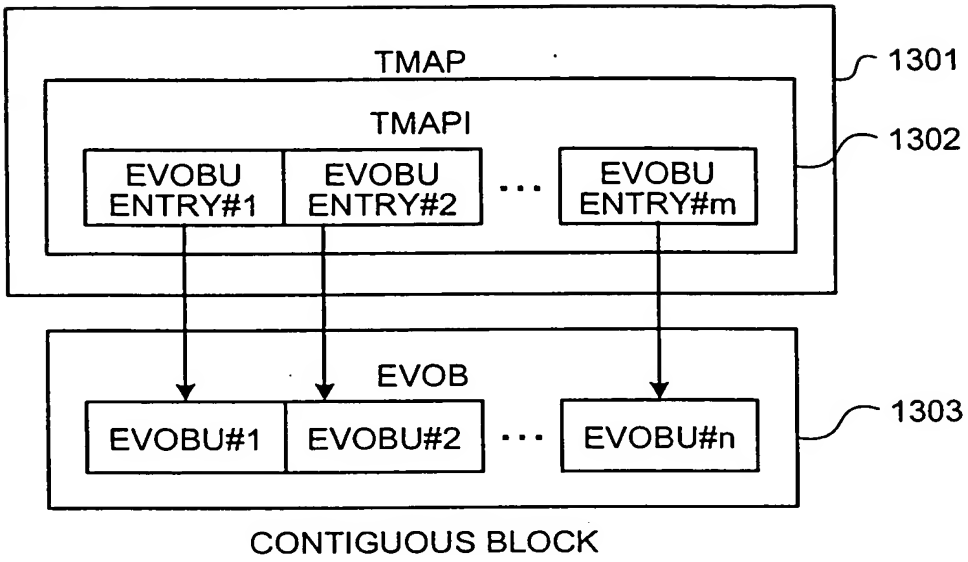

TMAP
1301
TMAPI
1302
EVOBU ENTRY#1
EVOBU ENTRY#2
EVOBU ENTRY#m
EVOB
1303
EVOBU#1
EVOBU#2
EVOBU#n
CONTIGUOUS BLOCK

FIG.14

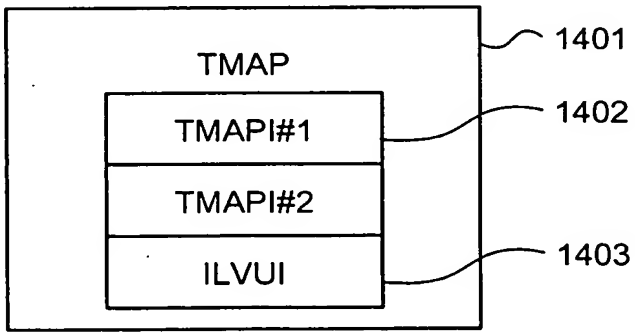

1401
TMAP
TMAPI#1
1402
TMAPI#2
ILVUI
1403

FIG.15

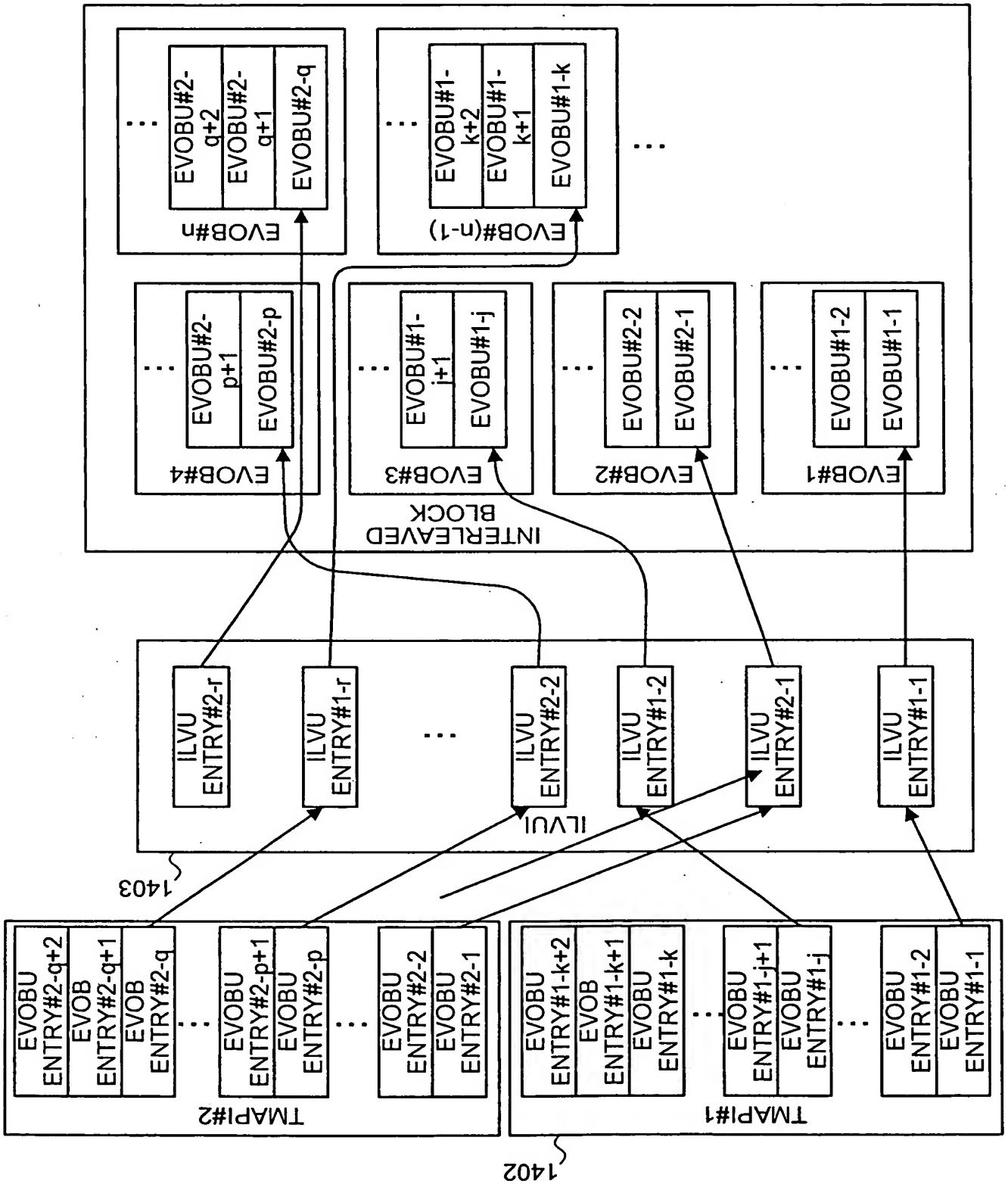

INTERLEAVED BLOCK
EVOB#n
EVOB#(n-1)
EVOB#4
EVOB#3
EVOB#2
EVOB#1
EVOBU#2-q
EVOBU#2-q+1
EVOBU#2-q+2
EVOBU#1-k
EVOBU#1-k+1
EVOBU#1-k+2
EVOBU#2-p
EVOBU#2-p+1
EVOBU#1-j
EVOBU#1-j+1
EVOBU#2-1
EVOBU#2-2
EVOBU#1-1
EVOBU#1-2
ILVU
ILVU ENTRY#2-r
ILVU ENTRY#1-r
ILVU ENTRY#2-2
ILVU ENTRY#1-2
ILVU ENTRY#2-1
ILVU ENTRY#1-1
1403
TMAP#2
TMAP#1
EVOBU ENTRY#2-q
EVOB ENTRY#2-q+1
EVOB ENTRY#2-q+2
EVOBU ENTRY#2-p
EVOBU ENTRY#2-p+1
EVOBU ENTRY#2-1
EVOBU ENTRY#2-2
EVOBU ENTRY#1-k
EVOB ENTRY#1-k+1
EVOB ENTRY#1-k+2
EVOBU ENTRY#1-j
EVOBU ENTRY#1-j+1
EVOBU ENTRY#1-1
EVOBU ENTRY#1-2
1402

FIG.16

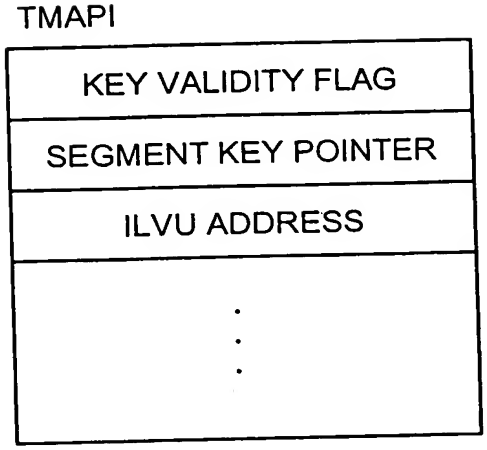
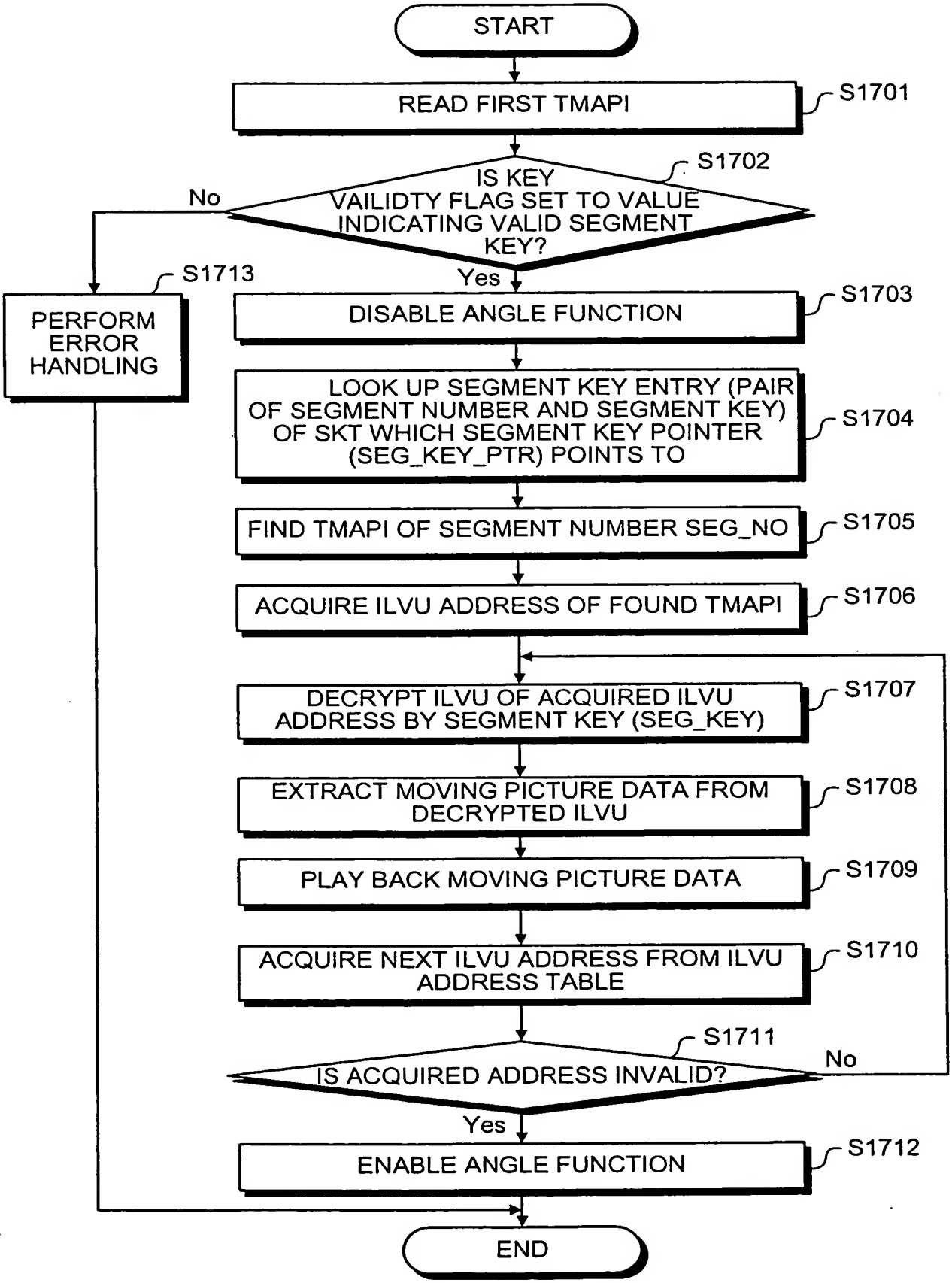


FIG.17


START
READ FIRST TMAPI
S1701
IS KEY VAILIDTY FLAG SET TO VALUE INDICATING VALID SEGMENT KEY?
S1702
No
Yes
PERFORM ERROR HANDLING
S1713
DISABLE ANGLE FUNCTION
S1703
LOOK UP SEGMENT KEY ENTRY (PAIR OF SEGMENT NUMBER AND SEGMENT KEY) OF SKT WHICH SEGMENT KEY POINTER (SEG_KEY_PTR) POINTS TO
S1704
FIND TMAPI OF SEGMENT NUMBER SEG_NO
S1705
ACQUIRE ILVU ADDRESS OF FOUND TMAPI
S1706
DECRYPT ILVU OF ACQUIRED ILVU ADDRESS BY SEGMENT KEY (SEG_KEY)
S1707
EXTRACT MOVING PICTURE DATA FROM DECRYPTED ILVU
S1708
PLAY BACK MOVING PICTURE DATA
S1709
ACQUIRE NEXT ILVU ADDRESS FROM ILVU ADDRESS TABLE
S1710
IS ACQUIRED ADDRESS INVALID?
S1711
No
Yes
ENABLE ANGLE FUNCTION
S1712
END